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ABSTRACT

The notions of recursiveness and deletion are discussed in the context of Chomsky's presentations of transformational grammar in "Syntactic Structures" and in the later work, "Aspects of the Theory of Syntax." After consideration of word-recursion, coordinate-clause recursion, and subordinate-clause recursion, extensions to discourse analysis are suggested. (AA)

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RECURSIVENESS AND DELETION IN ENGLISH: TWO COUNTERVALING FORCES

Don L. F. Nilsen

In 1957 Noam Chomsky discussed the subject of recursiveness in his Syntactic Structures. At that point he treated recursion by means of a cycling rewrite rule, a rule which could be applied over and over again indefinitely to produce such sentences as "He saw an old old old old old... man," or "He was very very very very very... tall." A point which Chomsky made at that time was that in a model representing linguistic competence, there is no principled cut-off point at which the grammar will say in effect, "one more of these items and you'll end up with an ungrammatical sentence," for such a decision would have to be arbitrary. Recursive elements are evidently like Jello--there's always room for more.

By allowing his competence-based model to have cycling or recursive rules, Chomsky was accounting for one aspect of linguistic creativity, because for every sentence in a corpus which contains a certain number of recursive elements there is theoretically another sentence possible which contains more of these elements. But this is nevertheless a rather trivial view of recursiveness--especially when compared with his expanded notion of recursiveness as outlined in his Aspects of The Theory of Syntax (1965). Chomsky's Aspects is a revision of the syntactic component of transformational grammar to make it more compatible with the semantic component then being developed by Katz, Fodor, and Postal. One of the most important contributions of the Aspects model of syntax is that it did away with the kernel

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sentence by generating embedded sentences within the sentences in which they are embedded. This means that embedded sentences are no longer generated separately, but rather that in the generation of a particular sentence the grammar must be allowed to go back through all of the rewrite rules each time a sentence embedding occurs. This is a much more significant view of the process of recursion since it accounts for the recursive nature of sentence embedding, and would therefore explain such sentences as "This is the cat that chased the rat that lived in the house that was beside the barn where there lived a cow which had a crumpled horn which is as ugly as sin which is a type of religious offense..." and on and on ad nausi

Frequently a sentence which is embedded inside of another sentence will share a certain amount of information with the matrix sentence. When this happens, the identity-deletion transformation or the identity-pronominalization transformation will go into operation, either deleting the redundant information, or pronominalizing it, with pronominalization actually being a form of partial deletion, since a pronoun always has fewer semantic features than its antecedent has. The resulting pronoun may be a personal pronoun as in "John likes his children," a reflexive pronoun, as in "John cut himself," an intensive pronoun, as in "John himself built the fireplace," an indefinite pronoun, as in "Somebody fell off the building," or a relative pronoun, as in "The boy who is outside is John." In each of these cases, the pronoun refers to a more fully specific (semantically) noun. And in each case the pronominalization is possible because a recursive transformation keeps reintroducing the same information. All instances after the first must either be pronominalized or deleted.

Now let's look at the relative pronoun and verb of the last example, "The boy who is outside is John." As a result of the recursive sentence-embedding transformation, the relative pronoun who is totally redundant, since all of this information is contained in the antecedent. And the verb is following who is also totally redundant since we know the tense from the main verb, and since the only other semantic information contained in this verb is equational. For these reasons, we can delete the who is from the sentence "The boy who is outside is John" to yield "The boy outside is John." In fact whenever there is sentence embedding either subordinately or coordinately, we can expect a certain amount of redundancy, and we can therefore make certain deletions. In comparative constructions we can say "John runs faster than Bill," and delete the last word runs. Subjects of gerunds and infinitives can be deleted assuming that subjects of main clauses can simultaneously play two roles, yielding "John enjoys (delete John's) watching girls," and "John expected (delete for John) to eat supper." Coordinate conjunction, obviously a type of recursive transformation, automatically deletes whatever is redundant and coordinately conjoins whatever is left. "John likes girls and Jim likes girls" becomes "John and Jim like girls" with conjoined subjects; "John likes girls and John likes boys" becomes "John likes girls and boys" conjoined direct objects; "John likes girls and John hates boys" becomes "John likes girls and hates boys" with conjoined verb phrases; and even "John likes girls and John hates girls" can become "John likes and hates girls" with conjoined verbs. If there is nothing redundant in the two conjoined sentences, then nothing is deleted, and it is therefore the sentences themselves which

are conjoined, as in "John likes girls and his brother prefers peanut butter sandwiches." This last type of conjunction is rather rare because there's no common element, and for this reason the contrastive conjunction but sounds more normal--"John likes girls but his brother prefers peanut butter sandwiches." It is possible to delete just the verb, so that "John likes girls and Jim likes boys" becomes "John likes girls and Jim boys," but although this is theoretically possible it sounds strange. Since there is a feeling that such a sentence contains a space or a gap, the process is known as gapping. When an entire verb cluster is repeated, it is also possible to stop at any point in the second occurence of the cluster. After we have said "Jim thought that John should have been doing his homework" we can continue with "but I didn't think that he should have been," or "...that he should have," or "that he should [illegible]." Since this process can be thought of as getting rid of more and more of the redundant and therefore non-essential verb cluster, it has been called sluicing.

Sentence recursion occurs not only in coordinate structures, but in subordinate structures as well. I mentioned this earlier, but let me return to it briefly. In order for a sentence to become a subordinate part of another sentence it must undergo a demotion transformation. There are six such transformations in English: 1. Subordinate-clause formation, 2. Relative-clause formation, 3. Gerund-phrase formation, 4. Infinitive-phrase formation, 5. Present-participle-phrase formation, and 6. Past-participle-phrase formation. A seventh subordinating process would be noun-compounding to produce cry baby (predicate plus subject), pin curl (predicate plus direct object), driver's license (subject plus direct object), or apple sauce (object of prep plus subject). The first two of these processes result in

clauses, and the others result in phrases. But as a general principle these dependent clauses can become phrases, and the phrases can become single words by the application of the identity deletion transformation, which itself must be a recursive transformation.

It would be an easy matter for me to end my presentation at this point, and to conclude by saying that the concept of word-recursion described in Syntactic Structures was a significant contribution but that the concept of coordinate-and subordinate-clause recursion described in Aspects of the Theory of Syntax was much more significant contribution. But let me not stop here, for I feel that we're on the threshold of a new discovery, the discovery of recursion at the discourse level. And let me suggest that here, as with clause recursion, there are the two countervailing forces of recursion and deletion. There are two threads that weave through any discourse: the one is the thread of organization and the other is the thread of relevance, or what Robin Lakoff terms "common topic." Both of these threads are possible through a recursion process, and whenever the concept does not reach the surface-structure level it fails to do so because of redundancy deletion. Let me illustrate with an example.

Suppose that in the first sentence of a discourse there is a mention of the time, the place, and other adverbial-type concepts. In every subsequent sentence, we could add this same time and place, because it is implied, but it doesn't reach the surface structure because after the first sentence it is redundant. It only reaches the surface if it changes, in which case, of course, it is no longer redundant. It is even possible for these adverbial elements to change without reaching the surface. Suppose, for example, that a discourse

is chronogically organized. In this case, the time of each sentence is different from that of every other sentence, being a little bit later than the preceding sentence and a little bit earlier than the sentence which follows. But it is nevertheless not necessary to state the time in every sentence since it can be established by the context in view of the general time, and in view of the basic organization of the discourse.

Common-topic must also be a recursive element. Whenever there are two sentences in a discourse there is always a precise relationship between them. Sometimes the relationship is explicitely stated, as in "John never received his Ph.D.," when it is followed by "Nevertheless, he is now an outstanding university professor." At other times the relationship is merely implied, as in "John received his Ph.D.," when it is followed by "John is a better professor than Jim, who didn't receive his doctorate." All sentences are related to each other through a thesis sentence, through the organization of the discourse, and through relation-signalling words throughout the discourse.

It's interesting that the amount of the recursion is determined by the nature of the discourse. If language is used for communication there is less redundancy than if it is used for social interaction or for group identification. Literary language is typically more redundant than is common everyday language, especially if the repetition of semantic features is considered an aspect of redundancy. One reason is that literary language is symbolic, and frequently simultaneously develops more than one level of meaning. Poetry is the most redundant language of all. There is graphic redundancy (as in eye rhyme), phonological redundance (as in alliteration,

assonance, rhythm, rhyme, slant rhyme, etc.), syntactic (as when patterns are repeated), and a great deal of semantic redundance. Of course the redundancy of literary language is added to the redundancy of ordinary language caused by the agreement of subjects with verbs, pronouns with antecedents, verbs with adverbs, numbers with nouns, etc.

I feel that the interaction of recursiveness with deletion is an important interplay at the discourse level. Unfortunately, we need to know more about discourses before we can investigate the interplay completely. But it is quite evident that it is a language universal, and that it is one of the important controls of the distribution of old and new information.

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